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NICKEL IN MARCH 2003

In March, reported domestic nickel consumption on a daily average basis was 7% less than that of February, according to the U.S. Geological Survey. Average daily nickel consumption of cathode, pellets, briquets, and ferronickel for stainless steel was 60.9 metric tons per day (t/d)—11% less than the 68.2 t/d for February, but 6% greater than the 57.2 t/d for March 2002. Consumption of elemental nickel to make superalloys decreased by 8% from February levels, but consumption to make corrosion-resistant nickel alloys increased slightly. Sales to plating companies averaged 27.3 t/d, about 12% less than the revised February sales figure of 30.8 t/d.

On March 31, U.S. consumer stocks of cathode, pellets, briquets, and powder totaled 1,270 metric tons (t)—19% less than the 1,560 t on February 28 and 25% less than the 1,700 t reported for yearend 2002. Stocks in London Metal Exchange (LME) warehouses worldwide totaled 24,348 t—84% greater than the 13,260 t on February 28. Preliminary data collected by the International Nickel Study Group indicated that, at the end of February, world nickel producers (excluding those in Austria, China, the former Yugoslavia, and the Ural area of Russia) had approximately 91,400 t of nickel in primary products in stock, of which 65,800 t or 72% was Class I materials. Class I materials are refined products with a nickel (Ni) content of 99% or greater (electrolytic cathode, pellets, briquets, rondelles, powder, etc.). Class II materials include ferronickel, oxide sinter, and East Asian utility nickel—products with a Ni content of less than 99%.

Percentages reported in the above paragraphs may not be verifiable owing to concealment of individual company proprietary data and late reporting of data.

The United States imported 16,900 t of primary nickel in the first 2 months of 2003, 21% less than the 21,600 t for the corresponding period of 2002. Class I materials accounted for 88% of total primary imports received during the first 2 months of 2003. Trade data for March will appear in a subsequent report.

Update: Nickel exploration intensifies in Brazil.

CVRD signs exploration protocols with the state governments of Ceará and Piauí.—Companhia Vale do Rio Doce (CVRD), the Brazilian iron ore mining giant, has signed exploration protocols with the state governments of Ceará and Piauí as part of the company's ongoing program to diversify into nonferrous metals mining. CVRD will initially prospect for copper in Ceará and nickel in Piauí. The company already has five copper mines under development in the Carajás region of Pará state, with the first—Sossego—scheduled to come onstream in mid-2004 (Kinch, 2003).

CVRD currently is evaluating nickeliferous laterite deposits at Capitão Gervásio Oliveira in the southeastern part of Piauí state. If the ongoing studies and tests are positive, CVRD is prepared to invest more than $500 million in the proposed mine and adjoining pressure acid leaching complex. Company officials envision a hydrometallurgical plant that would produce about 35,000 metric tons per year (t/yr) of nickel metal (Kinch, 2003).

CVRD is continuing its pre-feasibility engineering studies of the Vermelho (or Red) laterite deposits along the eastern base of the Serra dos Carajás in Pará state. (*See* Nickel in May 2002.) According to CVRD officials, the Vermelho deposits contain 171 million metric tons (Mt) of lateritic ore suitable for autoclaving that averages 1.74% Ni and 0.17% cobalt (Co). The pre-feasibility studies are scheduled to be completed by October 2003. The final feasibility study is due in December 2004. The Vermelho plant would be capable of producing 45,000 t/yr of nickel metal—about 30% more than the proposed Piauí plant—and could be commissioned as early as December 2007—2 or 3 years earlier than Piauí (Companhia Vale do Rio Doce, 2003).

In June 2001, CVRD signed a 10-year contract to be the exclusive supplier of lump iron ore and blast furnace pellets to Companhia Aços Especiais Itabira (ACESITA). ACESITA is the largest stainless steelmaker in Latin America and a significant consumer of nickel units. In 2002, ACESITA completed a $100 million modernization and expansion program that raised the production capacity of its stainless operations to 850,000 t/yr of crude steel from 400,000 t/yr. According to an ACESITA executive, actual production has remained at slightly more than 400,000 t/yr because of local market restraints, but productivity has improved significantly (Metal Bulletin, 2003).

Canico expands drilling program at its Onça-Puma laterite project.—Canico Resource Corporation has begun the second phase of an infill-drilling program at its Onça-Puma property in Pará state. The exploration concession is northeast of the town

of São Felix do Xingu and about 80 kilometers (km) southwest of Carajás. Inco Limited discovered the nickeliferous laterite deposits during the 1970s. The deposits lie beneath a series of low-lying hilltops and are close to the surface. Some of the hilltops currently are being used for cattle grazing. Exploration in Pará increased dramatically after construction of the huge Carajás iron mine and railway in 1980-87. Inco's original programs of auger drill sampling and test pitting revealed an inferred resource of at least 42 Mt of laterite grading about 2.3% Ni and 0.09% Co, based on a cut-off grade of 1.5% Ni. About 11 Mt of the resource lie within an indigenous reserve and would be excluded from the Canico project (Canico Resource Corp., 2003c, p. 2).

The total extent of the Onça-Puma nickel mineralization has not yet been determined. In September 2002, Canico began diamond drilling at the Puma West deposit. On January 20, 2003, Canico released updated resource data for both Puma West and the original Onça site. Combined inferred resources for the two projects have now grown to 53 Mt, averaging 2.2% Ni and 0.08% Co. Canico hopes to complete its feasibility study by late 2004. Environmental base line studies and social studies are also underway (Canico Resource Corp., 2003c, p. 2).

On February 25, 2003, Canico acquired 100% of the Brazilian company that holds the rights to Onça-Puma. Inco and Canico jointly managed the concession immediately prior to the February agreement. In exchange for relinquishing its rights to Canico, Inco received 18% of the issued common shares of Canico as well as a number of share purchase warrants (Canico Resource Corp., 2003a, b).

Canico is a junior resource company based in Vancouver, British Columbia. Oliver Gold Corp. and Hastings Resource Corp. merged in February 2002 to form the company. Some members of Canico's management and technical team came from Sutton Resources Ltd. and are familiar with the Kabanga nickel project spearheaded by Sutton in Tanzania (Canico Resource Corp., 2003c, p.1).

Solitario confirms high-grade palladium-platinum mineralization with nickel at Pedra Branca.—In early 2001, Solitario Resources Corp. began drilling a number of geophysical anomalies associated with the Pedra Branca ultramafic complex in the State of Ceará. Solitario wanted to find and develop near-surface zones enriched in platinum group elements (PGE). The Pedra Branca complex is geologically similar to the Bushveld Igneous Complex of South Africa—the largest PGE producing ore system in the world and an important source of byproduct nickel (Solitario Resources Corp., 2003b). Solitario became involved in the Pedra Branca project when it acquired Altoro Gold Corp. in 1999. Solitario initially focused its exploration efforts on the Esbarro deposit where previous drilling had encountered significant thicknesses of shallow PGE mineralization. The 1999-2000 drilling program was conducted under a joint venture agreement with Rockwell Ventures Inc. (Solitario Resources Corp., 2001a). Rockwell Ventures already had mapped part of the Pedra Branca area and identified three other prospects in addition to Esbarro—Curiu, Ipuerias, and Trapia. Rockwell Ventures collected more than 11,500 soil samples for assaying and drilled 31 holes totaling 2,132 meters. Seventeen of the 31 holes intersected ultramafic chromitite assemblages. Platinum values in the assemblages ranged from 0.04 to 12.3 grams per metric ton (g/t); palladium, 0.08 to 17.0 g/t; and nickel, 0.04 to 2.65% (Solitario Resources Corp., 2001b).

In June 2001, Rockwell Ventures pulled out of the Pedra Branca project, leaving Solitario in control of the property. In November 2001, Solitario launched its own drilling program. Solitario subsequently discovered additional mineralization in the Trapia and Curiu areas and identified two other mineralized areas—Cedro and Santo Amaro. Platinum values in the Cedro assemblages ranged from 0.32 to 1.22 g/t; palladium, 0.53 to 3.38 g/t; and nickel, 0.08 to 0.30% (Solitario Resources Corp., 2002). In February 2003, Solitario signed an agreement with Anglo American Platinum Corporation Ltd. allowing Anglo Platinum to earn a 51% interest in Pedra Branca. To earn the full 51%, Anglo Platinum must spend $7 million over the next 4 years exploring the 20 PGE prospects identified to date. The project now covers an area 50 km long and 15 km wide. Anglo Platinum can increase its share to 65% by completing a bankable feasibility study and arranging 100% project financing. Anglo Platinum is the world's leading producer of platinum (Solitario, 2003a, b).

References Cited

Canico Resource Corp., 2003a, Closing of Onça-Puma agreement to proceed: Vancouver, British Columbia, Canada, Canico Resource Corp., press release no. 7-03, February 14, 2 p.

Canico Resource Corp., 2003b, Onça-Puma agreement has closed: Vancouver, British Columbia, Canada, Canico Resource Corp., press release no. 9-03, February 25, 2 p.

Canico Resource Corp., 2003c, Onça-Puma property: Vancouver, British Columbia, Canada, Canico Resource Corp., qwik report, June 25, 20 p.

Companhia Vale do Rio Doce, 2003, Níquel do Vermelho project: Presentation by the Base Metals Projects Department of the Non-Ferrous Division, May, 4 slides.

Kinch, Diana, 2003, CVRD to intensify nickel, copper activity: Metal Bulletin, no. 8777, May 29, p. 6.

Metal Bulletin, 2003, Acesita constrained in stainless despite expansion: Metal Bulletin, no. 8781, June 12, p. 18.

Solitario Resources Corp., 2001a, Solitario reports initial drill results from Pedra Branca: Denver, CO, Solitario Resources Corp., press release, April 30, 2 p.

Solitario Resources Corp., 2001b, Solitario to initiate exploration on 100%-owned Pedra Branca PGM project: Denver, CO, Solitario Resources Corp., press release, June 4, 5 p.

Solitario Resources Corp., 2002, Solitario intersects significant mineralization in new areas on its Pedra Branca platinum-palladium prospect: Denver, CO, Solitario Resources Corp., press release, January 21, 3 p.

Solitario Resources Corp., 2003a, Solitario confirms continuity of high-grade mineralization on its Pedra Branca PGM-project: Denver, CO, Solitario Resources Corp., press release, July 9, 2 p.

Solitario Resources Corp., 2003b, Solitario signs agreement with Anglo American Platinum Corporation on its Pedra Branca project: Denver, CO, Solitario Resources Corp., press release, February 4, 2 p.

TABLE 1
CONSUMPTION OF NICKEL (EXCLUSIVE OF SCRAP), BY FORM AND USE[1]

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total	Total year to date
2002:					
March	4,730 r	723	370	5,830 r	17,500 r
April	5,070 r	879	280	6,230 r	23,800 r
May	4,730 r	722	81	5,530 r	29,300 r
June	5,150 r	873	254	6,280 r	35,600 r
July	5,210 r	730	266	6,200 r	41,800 r
August	5,230 r	843	230	6,310 r	48,100 r
September	5,130 r	754	59	5,950 r	54,000 r
October	5,330 r	750	62	6,140 r	60,200 r
November	4,830 r	632	58	5,520 r	65,700 r
December	4,750 r	505	53	5,310 r	71,000 r
January-December	59,600 r	9,080	2,270	71,000 r	XX
2003:					
January	5,180 r	529	75 r	5,780 r	5,780 r
February	4,820 r	390	23 r	5,230 r	11,000 r
March:					
Steel:					
Stainless and heat resisting	1,230	653	W .	1,890	5,950
Alloy (excludes stainless)	226	--	W	226	866
Superalloys	1,010	--	W	1,010	2,880
Copper-nickel alloys	W	--	--	W	W
Electric, magnetic, and expansion alloys	13	--	--	13	55
Other nickel & nickel alloys	W	--	W	W	W
Cast iron	W	--	--	W	W
Electroplating (sales to platers)	845	--	--	845	2,600
Chemical and chemical uses	W	--	--	W	W
Other uses	1,390	--	42	1,430	4,070
Total reported	4,720 [2]	653	42	5,410	16,400
Total all companies (calc)[3]	XX	XX	XX	8,330	25,300
2003: January-March	14,700	1,570	139	16,400	XX
2002: January-March	14,200	2,390	931	17,500	XX

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Other uses" category. XX Not applicable. -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Of consumption, 4,020 metric tons was consumed as cathodes and pellets, the remainder as briquets and powder.
[3]Figures represent calculated apparent consumption; based on the revised proportion of reported primary consumption (65.01%) to apparent primary consumption for 2001.

TABLE 2
ENDING STOCKS OF NICKEL (EXCLUSIVE OF SCRAP) HELD BY CONSUMERS, BY FORM AND USE [1, 2]

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total
2002:				
March	2,340	494	135	2,970
April	2,490	513	94	3,100
May	2,250	82	127	2,460
June	1,840	63	138	2,040
July	1,580	98	97	1,770
August	1,910	112	83	2,100
September	2,370	89	78	2,530
October	1,990	140	76	2,210
November	1,820	93	84	2,000
December	1,700	60	81	1,840
2003:				
January	1,380 r	100	44	1,520 r
February	1,560	54	34	1,650
March:				
Steel (stainless, heat resisting and alloy)	325	(3)	(3)	325
Nonferrous alloys[4]	928	(3)	(3)	928
Foundry (cast irons)	(3)	--	--	(3)
Chemical (catalysts, ceramics, plating salt, etc.) and unspecified uses	20	148	43	211
Total	1,270	148	43	1,460

rRevised. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Stocks held by companies that consume nickel in more than one end-use category are credited to the major category. Stocks are subject to revisions owing to inventory adjustments.

[3]Included in the "Chemical and unspecified uses" category.

[4]Includes superalloys, nickel-copper and copper-nickel alloys, permanent magnet alloys, and other nickel alloys.

TABLE 3
CONSUMPTION AND ENDING STOCKS OF PURCHASED SECONDARY NICKEL, BY USE[1]

(Metric tons, nickel content)

	Consumption			Stocks		
Period	Ferrous scrap[2]	Nonferrous scrap[3]	Total scrap	Ferrous scrap[2]	Nonferrous scrap[3]	Total scrap
2002:						
March	5,150	725 r	5,870 r	2,950	102	3,050
April	5,180	669 r	5,850 r	2,980	109	3,090
May	5,020	553 r	5,580 r	3,690	97	3,790
June	6,380	483 r	6,860 r	3,300	103	3,410
July	5,950	649 r	6,600 r	3,280	97	3,380
August	6,110	598 r	6,710 r	3,110	105	3,210
September	4,820	542 r	5,360 r	3,400	110	3,510
October	5,210	596 r	5,810 r	3,540	102	3,640
November	4,640	443 r	5,080 r	3,240	100	3,340
December	3,920	577 r	4,500 r	3,210	98	3,310
January-December	62,200	7,310 r	69,500 r	XX	XX	XX
2003:						
January	4,760 r	582 r	5,340 r	3,420 r	107 r	3,530
Februaryr	4,080	633	4,710	3,080	96	3,180
March	6,470	513	6,990	2,930	108	3,040
2003: January-March	15,300	1,730	17,000	XX	XX	XX
2002: January-March	15,000	2,200	17,200	XX	XX	XX

rRevised. XX Not applicable.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Nickel content is calculated from an average nickel content and the reported gross weight of scrap.

[3]Combined consumption and stocks of aluminum-base, copper-base, and nickel-base scrap.

TABLE 4
U.S. IMPORTS FOR CONSUMPTION OF NICKEL, BY COUNTRY[1]

(Metric tons, nickel content)[2]

Period and country of origin	Cathodes pellets, and briquets	Powder and flakes	Ferro-nickel	Metal-lurgical-grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total[3]	Total year to date[4]	Wrought nickel
2002:										
February	11,900	427	620	128	341	235	235	13,900	22,900	109
March	5,760	813	679	54	315	275	277	8,180	31,000	30
April	6,220	551	983	--	221	349	274	8,590	39,600	116
May	6,600	590	1,240	14	221	477	298	9,450	49,100	53
June	8,950	391	1,160	238	174	460	228	11,600	60,700	43
July	11,800	627	1,080	214	367	874	225	15,200	75,900	69
August	7,750	603	1,790	127	152	762	171	11,400	87,200	72
September	13,000	566	1,570	2	160	641	194	16,200	103,000	85
October	5,140	609	1,010	11	230	564	183	7,740	111,000	106
November	6,560	684	991	27	181	627	222	9,300	120,000	51
December	6,970	512	750	16	225	530	312	9,310	130,000	70
January-December	97,200	6,970	12,300	1,230	3,030	6,080	2,860	130,000	XX	878
2003:										
January	5,950	928	605	10	341	322	223	8,380	8,380	55
February:										
Australia	1,190	140	--	8	--	--	--	1,340	2,380	--
Brazil	40	--	--	--	--	--	--	40	122	--
Canada	3,480	426	--	--	122	215	--	4,240	9,070	2
Colombia	--	--	--	--	--	3	--	3	245	--
Dominican Republic	--	--	803	--	--	4	--	807	1,070	--
Finland	440	127	--	--	--	--	22	589	1,030	--
France	234	--	--	--	39	--	91	364	508	78
Germany	13	14	--	--	18	(5)	13	58	150	23
Japan	--	4	(5)	--	--	--	50	54	92	9
Mexico	--	--	--	--	3	157	1	161	303	--
New Caledonia	--	--	--	--	--	--	--	--	100	--
Norway	1,520	--	--	--	7	--	--	1,530	1,550	--
Russia	112	186	113	--	--	--	--	411	1,050	--
South Africa	--	15	--	--	--	--	--	15	15	--
Sweden	--	8	--	--	--	--	--	8	12	--
United Kingdom	18	20	--	--	118	3	10	169	348	(5)
Venezuela	--	--	--	--	--	1	--	1	1	--
Zimbabwe	20	--	--	--	--	--	--	20	60	--
Other	--	14	--	--	16	41	82	153	236	3
Total	7,060	954	916	8	323	424	269	9,960	18,300	115
2003: January-February	13,000	1,880	1,520	18	664	745	494	18,300	XX	168
2002: January-February	18,500	1,020	1,070	528	784	519	479	22,900	XX	184

XX Not applicable. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%); sulfates (22%); other salts (22%); supported catalysts (22%); and oxide, sesquioxide, and hydroxide (65%).

[3]Excludes wrought nickel.

[4]May include revisions for prior months.

[5]Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 5
U.S. EXPORTS OF NICKEL, BY COUNTRY[1]

(Metric tons, nickel content)[2]

Period and country of destination	Cathodes pellets, and briquets	Powder and flakes	Ferro-nickel	Metal-lurgical-grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total[3]	Total year to date	Wrought nickel
2002:										
February	170	81	3	152	989	3,720	229	5,350	8,330	167
March	245	151	(4)	64	1,470	2,040	219	4,190	12,500	262
April	186	113	--	68	1,280	3,890	226	5,770	18,300	139
May	65	119	10	111	1,360	1,900	213	3,780	22,100	271
June	105	134	(4)	19	1,550	2,500	155	4,470	26,500	283
July	131	139	1	9	1,560	2,040	204	4,080	30,600	200
August	76	222	1	42	826	1,510	168	2,840	33,400	230
September	164	122	2	55	718	1,660	153	2,880	36,300	249
October	113	99	8	34	1,010	1,840	167	3,280	39,600	221
November	64	95	8	6	830	1,470	184	2,650	42,300	181
December	75	65	7	3	983	2,080	423	3,630	45,900	175
January-December	1,740	1,480	46	685	13,700	25,700	2,570	45,900	XX	2,570
2003:										
January	92	58	10	11	853	3,060	267	4,350	4,350	586
February:										
Australia	--	(4)	--	--	--	--	--	(4)	17	16
Belgium	--	1	--	--	11	3	27	42	92	19
Canada	3	18	--	3	682	270	65	1,040	2,100	5
China	--	--	13	--	--	557	2	572	851	--
Germany	--	13	--	--	9	1	6	29	59	17
India	(4)	(4)	--	--	8	23	--	31	64	--
Italy	--	(4)	--	--	--	458	--	458	460	50
Japan	--	21	--	1	58	28	34	142	282	31
Korea, Republic of	--	3	--	--	--	195	44	242	715	1
Mexico	21	4	--	--	--	7	4	36	174	24
Netherlands	--	(4)	--	--	--	275	2	277	284	2
South Africa	--	--	--	3	45	--	1	49	52	--
Spain	--	--	--	--	--	600	--	600	1,590	--
Sweden	--	(4)	--	--	63	3	--	66	99	--
Taiwan	--	(4)	--	--	--	2,460	8	2,470	2,940	--
United Kingdom	--	3	--	--	57	132	11	203	289	130
Other	--	21	--	--	15	33	57	126	659	167
Total	24	84	13	7	948	5,050	261	6,380	10,700	462
2003: January-February	116	142	23	17	1,800	8,110	528	10,700	XX	1,050
2002: January-February	514	216	10	274	2,100	4,750	463	8,330	XX	359

XX Not applicable. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%); sulfates (22%); other salts (22%); supported catalysts (22%); and oxide, sesquioxide, and hydroxide (65%).

[3]Excludes wrought nickel.

[4]Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF NICKEL ALLOYS, BY COUNTRY[1]

(Metric tons, gross weight)

Period and country of origin	Unwrought alloyed ingot	Bars, rods and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total	Total year to date
2002:									
February	183	177	408	227	1	248	154	1,400	3,070
March	256	207	407	293	(2)	327	159	1,650	4,710
April	390	229	531	254	(2)	233	151	1,790	6,500
May	179	248	456	289	1	337	162	1,670	8,170
June	232	293	401	286	15	511	122	1,860	10,000
July	133	259	624	361	31	124	196	1,730	11,800
August	170	217	360	356	34	180	161	1,480	13,200
September	64	153	412	207	35	243	131	1,250	14,500
October	180	150	400	212	28	106	117	1,190	15,700
November	231	279	324	348	28	194	149	1,550	17,200
December	170	192	510	353	21	147	153	1,550	18,800
January-December	2,540	2,640	5,230	3,520	194	2,850	1,810	18,800	XX
2003:									
January	54	252	427	332	(2)	133	91	1,290	XX
February:									
Australia	76	--	1	--	--	--	--	77	154
Belgium	25	--	(2)	--	--	--	(2)	25	27
Canada	--	1	5	--	--	1	6	13	20
China	--	--	2	--	--	--	27	29	48
France	--	--	67	7	--	1	5	80	184
Germany	3	51	89	136	10	59	4	352	803
Italy	--	62	--	--	--	--	2	64	205
Japan	4	--	2	--	--	1	2	9	52
Mexico	--	--	--	--	--	--	79	79	128
Netherlands	--	--	--	--	--	--	2	2	5
South Africa	39	--	--	--	--	--	--	39	39
Sweden	--	8	177	4	--	4	(2)	193	345
United Kingdom	19	34	10	117	--	26	3	209	411
Other	1	2	3	--	1	1	10	18	56
Total	167	158	356	264	11	93	140	1,190	2,480
2003: January-February	221	410	783	595	11	226	231	2,480	XX
2002: January-February	536	408	806	556	1	451	308	3,070	XX

XX Not applicable. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 7
U.S. EXPORTS OF NICKEL ALLOYS, BY COUNTRY[1]

(Metric tons, gross weight)

Period and country of destination	Unwrought alloyed ingot	Bars, rods and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total	Total year to date
2002:									
February	808	600	106	596	43	115	340	2,610	5,120
March	884	626	178	505	11	197	653	3,050	8,180
April	618	451	96	476	12	204	278	2,130	10,300
May	862	495	99	638	32	136	297	2,560	12,900
June	1,070	393	142	567	8	127	363	2,670	15,500
July	437	518	94	392	8	144	307	1,900	17,400
August	951	527	142	545	15	128	426	2,730	20,200
September	788	568	174	733	4	133	333	2,730	22,900
October	290	507	146	717	3	187	320	2,170	25,100
November	739	418	174	546	10	147	295	2,330	27,400
December	415	316	78	302	14	115	426	1,660	29,100
January-December	8,720	6,020	1,520	6,590	169	1,770	4,290	29,100	XX
2003:									
January	729	375	138	236	12	231	192	1,920	XX
February:									
Australia	--	(2)	--	(2)	--	--	1	(2)	4
Belgium	13	48	5	28	--	--	1	95	137
Canada	6	82	14	19	1	23	75	220	537
France	220	52	1	31	1	(2)	4	309	452
Germany	775	49	2	17	(2)	7	14	864	1,440
India	5	1	(2)	2	8	--	5	21	39
Ireland	--	--	(2)	2	--	(2)	1	3	4
Italy	1	2	1	1	(2)	5	4	14	35
Japan	12	16	(2)	9	--	1	5	43	79
Korea, Republic of	22	(2)	(2)	3	(2)	6	15	46	90
Mexico	2	10	50	19	--	60	136	277	450
Netherlands	--	2	--	1	--	1	1	5	46
Singapore	1	--	(2)	(2)	--	4	(2)	5	11
Spain	17	1	--	--	--	--	(2)	18	45
Sweden	--	--	--	6	--	(2)	(2)	6	8
Switzerland	42	--	(2)	8	(2)	1	(2)	51	101
Taiwan	--	--	(2)	3	--	25	3	31	59
United Kingdom	23	107	5	40	2	7	3	187	389
Other	16	49	15	26	26	28	106	266	448
Total	1,160	419	93	215	38	168	374	2,460	4,380
2003: January-February	1,880	793	231	452	50	399	567	4,380	XX
2002:January-February	1,670	1,200	199	1,170	52	249	588	5,120	XX

XX Not applicable. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 8
NICKEL CONSUMPTION IN CAST AND WROUGHT PRODUCTS

	Percent	
	Wrought	Cast
March 2003:		
Stainless and heat resisting steels	68	32
Alloy steels	100	(1)
Superalloys	90	10
Copper-nickel alloys	100	(1)
Other nickel-base alloys	100	(1)

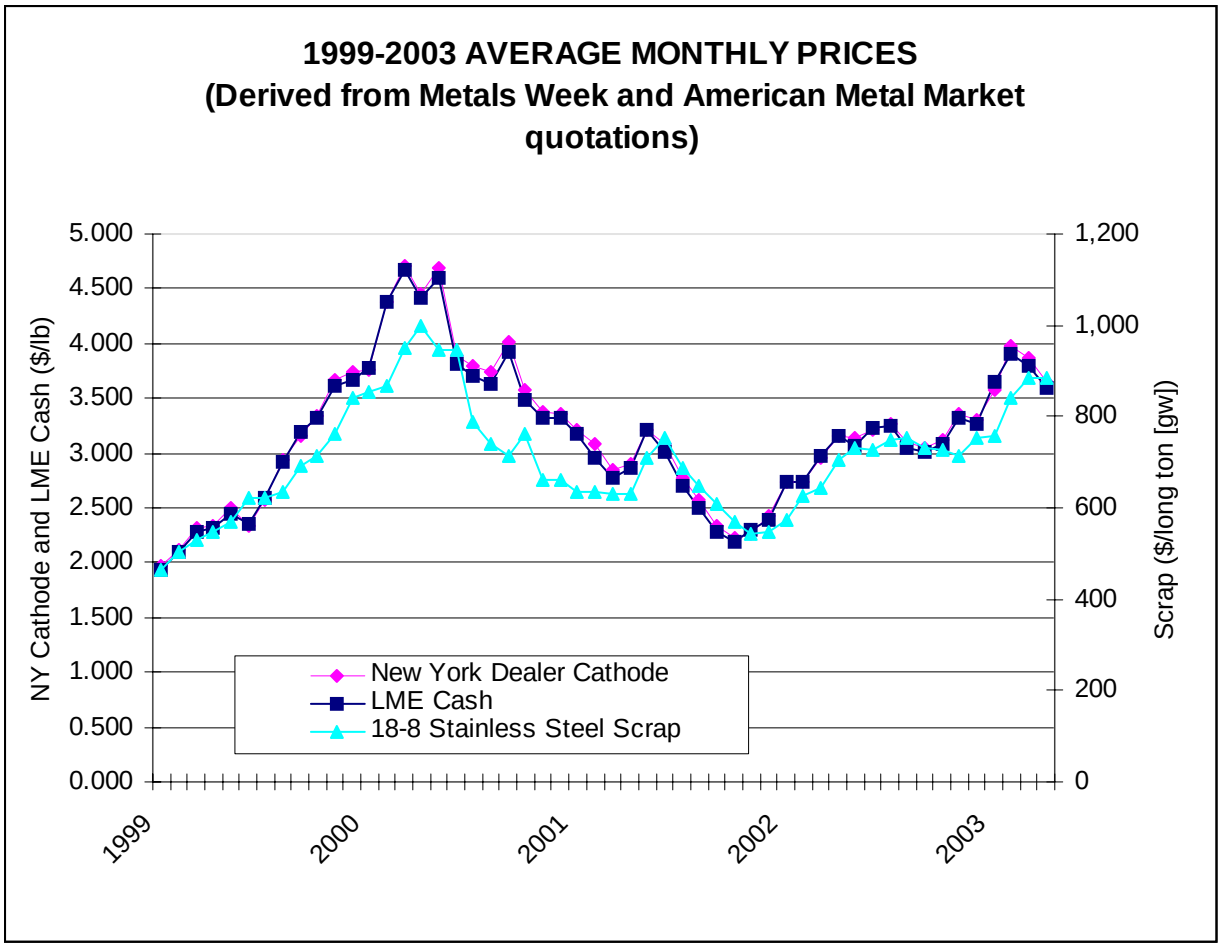
[1]Less than 1/2 unit.

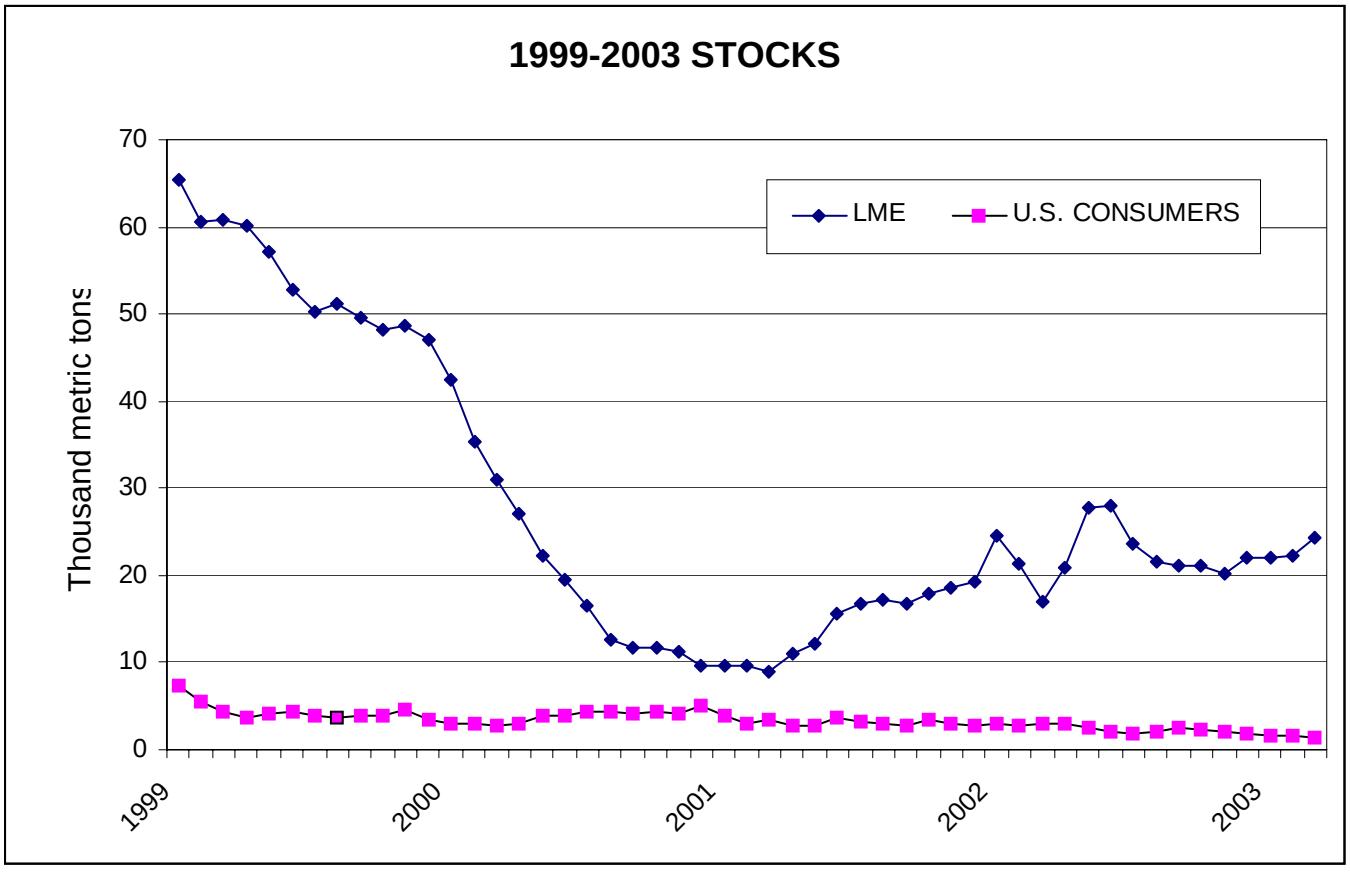
TABLE 9
NICKEL PRICES

	Platts Metals Week				American Metal Market
Date	Cathode NY Dealer $/lb.	LME Cash $/t	LME Cash $/lb.	18/8 Stainless steel scrap Free market $/long ton (gw)	18/8 Stainless steel scrap Pittsburgh $/long ton (gw)
2002:					
Average for month of:					
March	2.963	6,537.500	2.965	XX	643
April	3.163	6,958.214	3.156	XX	705
May	3.130	6,761.364	3.067	XX	731
June	3.213	7,119.861	3.230	XX	725
July	3.268	7,142.717	3.240	XX	748
August	3.094	6,717.143	3.047	XX	755
September	3.053	6,640.238	3.012	XX	733
October	3.118	6,804.457	3.086	XX	729
November	3.349	7,313.929	3.318	XX	716
December	3.308	7,193.158	3.263	XX	755
Yearly average	3.095	6,771.751	3.072	XX	703
2003:					
Average for week ending:					
March 7	4.14-4.25	8,852.500	4.015	870-890	880-890
March 14	3.87-4.07	8,460.500	3.838	875-895	880-890
March 21	3.78-3.92	8,223.500	3.730	880-900	880-890
March 28	3.67-3.90	8,067.500	3.659	885-895	880-890
April 4	3.65-3.73	7,859.500	3.565	885-895	880-890
April 11	3.63-3.78	7,855.000	3.563	885-895	880-890
April 18	3.69-3.83	8,068.750	3.660	885-895	880-890
April 25	3.65-3.83	7,885.000	3.577	860-880	880-890
Average for month of:					
January	3.580	8,026.020	3.641	XX	757
February	3.978	8,623.000	3.911	840	840
March	3.865	8,378.810	3.801	886	885
April	3.655	7,910.125	3.588	885	885

XX Not applicable.

NOTE
On February 6, 2003, Platts Metals Week began assessing a weekly North American Free Market 18-8 stainless steel scrap price. The price is being published as a range, in dollars per long ton (gross weight), reflecting the majority of spot business. Specifications are: material sold in bundles and solids, minimum nickel content of 7-9%, minimum chromium content of 17%, delivered plant, loaded on trucks or barges, minimum quantity 1,000 long tons, net 30-day standard payment terms.


1999-2003 AVERAGE MONTHLY PRICES
(Derived from Metals Week and American Metal Market quotations)
NY Cathode and LME Cash ($/lb)
Scrap ($/long ton [gw])
5.000
4.500
4.000
3.500
3.000
2.500
2.000
1.500
1.000
0.500
0.000
1,200
1,000
800
600
400
200
0
New York Dealer Cathode
LME Cash
18-8 Stainless Steel Scrap
1999
2000
2001
2002
2003


1999-2003 STOCKS
Thousand metric tons
70
60
50
40
30
20
10
0
LME
U.S. CONSUMERS
1999
2000
2001
2002
2003